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ABSTRACT

This report presents findings of exploratory research on success, retention, and persistence in math courses at Cuesta College. The following research questions were addressed: (1) How do success rates in Math 23 (elementary algebra) and Math 27 (intermediate algebra) compare with traditional and computer-assisted formats? (2) What are the profiles of successful and unsuccessful students in traditional and computer-assisted Math 23 and Math 27 courses? (3) How do matriculation and subsequent course success rates differ between students who complete traditional or computer-assisted Math 23 or Math 27 courses? (4) How do success and retention rates compare for Math 29 (trigonometry) students who first took Math 42 (precalculus algebra) and those who do not? and (5) How do success and retention rates in Math 65A (analytic geometry and calculus) compare between students who completed Math 29 & 42 or Math 29 & 63 (precalculus mathematics)? Cohorts of students were followed between spring 1996 and spring 1999. Students receiving passing grades or credit were defined as successful, and students who did not withdraw from the course were defined as retained. Results indicate few significant differences between traditional and computer-assisted course formats in terms of student outcomes. The two greatest predictors of success and retention were course load and prior grade point average. (Contains 68 tables.) (RDG)

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Preliminary Success and Retention Rates in Selected Math Courses

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Executive Brief

Background:

The following exploratory research examines five research questions concerning success, retention and persistence in selected Math courses. The questions are:

1. **How do Success and Retention Rates in *Math 23* compare between traditionally taught and computer-assisted courses?**

   1a. **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted *Math 23* courses?**

2. **How do Success and Retention Rates in *Math 27* compare between traditionally taught and computer-assisted courses?**

   2a. **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted *Math 27* courses?**

3. **How do matriculation and subsequent course success rates in target courses differ between students who complete traditionally taught or computer-assisted *Math 23* or *Math 27* precursor courses?**

4. **How do Success and Retention Rates compare in *Math 29* between students who first take *Math 42* and those who do not?**

5. **How do Success and Retention Rates in *Math 65A* compare between students who arrived there via completion of *Math 29* and *42* or *Math 29* and *63*?**

Methodology:

Cohorts of students were followed (retrospectively) between spring 1996 and spring 1999 inclusive. Student outcomes were measured using the standardized definitions of Success and Retention (Partnership for Excellence). A student is identified as successful if he or she obtains a letter grade of **"A," "B," "C," or "CR"**. A student is identified as not successful if he or she obtains a letter grade **of "D", "F", "W," or "NC"**. A student is considered not retained if he or she receives a letter grade of **"W"**. A student who receives any other letter grade—including **"I"** and **"RD"**—is considered retained.

Statistical tests for significant differences and relationships in frequency distributions were performed (Phi-Square, Chi-Square, Cramer's V, as well as contingency coefficients). However, they are of dubious worth in interpreting the results. This is due to the non-randomness of the samples employed. In other words, because students self-selected into their respective courses of interest, it is difficult to attribute treatment effects to instructional modalities, without having appropriate controls on who enters each course. This problem is somewhat mitigated by examining the profiles of students who enrolled in each course. Still it would be difficult to recommend any specific generalizations from this sample to hypothetically similar populations in the future.

Results:

With the former caveats in mind, some interesting findings do nevertheless suggest the need for further investigation. First, there appear to be no significant differences in Success and Retention Rates in Math 23, despite disparate proportions, between students exposed to traditionally taught and computer-assisted instructional modalities. Success rates *are* lower in the computer-assisted classes (43.2% compared to 47.6% in the traditionally taught courses), yet not significantly lower. Paradoxically, Retention rates are higher in Math 23 in the computer-assisted courses (75.7% compared to 73.3% in the computer-assisted classes).

Math 27 exhibits a parallel pattern, except that the Success Rate in traditionally taught Math 27 courses is significantly (statistically) greater than the Success Rate in computer-assisted Math 27 courses (51.5% compared to 46.5%).

A central—albeit schizophrenic—finding is that the computer-assisted Math 23 and Math 27 students show greater retention rates, whereas the traditionally taught students have higher success rates. So, colloquially, computer-assisted Math 23 and 27 students "*hang in there*' more than traditionally taught students; but they do so to their detriment, it seems, as they are less successful despite their presence in the classroom.

When examining matriculation and persistence patterns subsequent to enrolling in Math 23 and/or 27, note that the percentage of successful students in computer-assisted Math 27 classes who went on to enroll in either Math 29 or Math 42 is considerably greater then that of the traditionally taught classes (51.1% compared to 38.1%). The decision to enroll in Math 29 or 42 is, to some degree, a function of the students' intentions toward transfer. Supportive of this hypothesis, the computer-assisted sample indicated in a greater proportion a goal of transfer than the traditionally taught students. Nevertheless, the difference in the proportions is, in and of itself, too small to decisively explain away the differences in persistence to either Math 29 or 42. Beyond this observation, no further relationships are obvious in terms of matriculation and persistence after Math 23 and/or 27.

An analysis of the profiles of successful and non-successful students in Math 23 and Math 27 reveals that the two greatest predictors of success and retention are course load and prior GPA, regardless of instructional modality. In addition, there appear to be no significant ethnic, gender or age differences in success and retention between the computer-assisted and traditional approaches. There are other slight differences between the instructional modalities. Unfortunately, most of the differences derive from small sample sizes—thus undermining their potency.

Second, an exploration of prerequisite paths taken to arrive at Math 29 uncovers a significantly greater retention rate among those students who first completed Math 42 than among those who did not (84.3% compared to 73.6%). Success rates, on the other hand, were virtually identical between the prerequisite paths. Given the relatively small sample size (51) of the group who had taken Math 42 before Math 29, an understanding of the relationship will benefit from more data.

Finally, Success and Retention in Math 65A is greater among students who took Math 29 and Math 63, rather than Math 29 and Math 42. However, the number of students who took Math 29 and 42 prior to Math 65A is a paltry 26. This question-as in the case above-will benefit from continued data collection.

Coda:

The reasons for success and non-success, retention and withdrawal are very complicated, especially in Math courses. There are several covariates that are impossible or impractical to control—not the least of which are: K-12 instruction in Math, socioeconomic status, motivation, instructor grade variation, not to mention the unforeseen vicissitudes of students' daily lives. Notwithstanding these hurdles, the answers as to what factors influence success might benefit from in-class surveying of students. Specifically, learning style inventories (a la Dave Diaz), in addition to the collection of more personal data unattainable from the traditionally collected data, might be a means of explaining a greater proportion of the respective variances in Success and Retention Rates.

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RESEARCH QUESTION 1:

1. **How do Success and Retention Rates in *Math 23* compare between traditionally taught and computer-assisted courses?**

   1a. What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted *Math 23* courses?

Mathematics Research - Math 23

Research Question 1: **How do Success and Retention Rates in Math 23 compare between traditionally taught and computer-assisted courses?**

Sample: The sample is comprised of Students enrolled in Math 23 in either Fall or Spring semesters (1996-1999); data from Summer sessions were not included.

Methodology: Student outcomes were evaluated by comparing the success and retention rates between traditional and computer-assisted modalities of instruction.

Definitions:
Successful = A, B, C, CR
Success Rate = A, B, C, CR / A, B, C, D, F, W, CR, NC
Not Successful = D, F, W, NC
Non-Success Rate = D, F, W, NC / A, B, C, D, F, W, CR, NC
Retained = A, B, C, D, F, CR, NC
Retention Rate = A, B, C, D, F, CR, NC, I, RD / A, B, C, D, F, W, CR, NC, I, RD
Significance level = if p <= .05, the test is deemed "Significant"; if p >.05, the test is deemed "Not Significant"

RESULTS

1) Success by Instructional Modality

TABLE 1	Traditional Instruction		Computer-Assisted	
	Count	%	Count	%
Not Successful	1681	52.4	191	56.8
Successful	1525	47.6	145	43.2
Total	3206	100.0	336	100.0

Phi,Cramer's V, Contingency Coefficient Not Significant (p=.123)

2) Grade Distribution by Instructional Modality

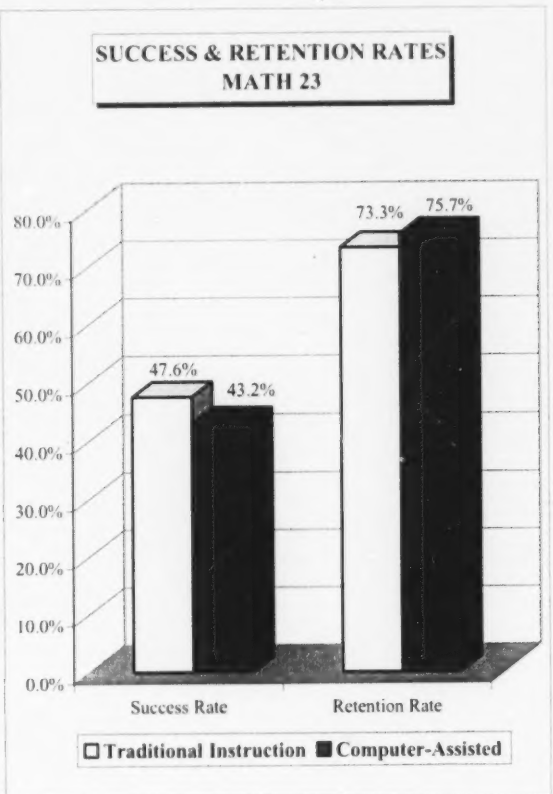
TABLE 2	Traditional Instruction		Computer-Assisted	
	Count	%	Count	%
A	338	10.5	26	7.7
B	484	15.1	45	13.4
C	611	19.0	59	17.5
CR	92	2.9	15	4.5
D	312	9.7	39	11.6
F	454	14.1	55	16.3
I	8	0.2	1	0.3
NC	56	1.7	15	4.5
RD	1	0.0	0	0.0
W	859	26.7	82	24.3
Total	3215	100.0	337	100.0

Pearson Chi-Square Significant (p=.018)

3) Retention by Instructional Modality

TABLE 3	Traditional Instruction		Computer-Assisted	
	Count	%	Count	%
Withdrawal	859	26.7	82	24.3
Retained	2356	73.3	255	75.7
Total	3215	100.0	337	100.0

Phi,Cramer's V, Contingency Coefficient Not Significant (p=.345)



COMMENTS

Initial indications from this analysis are that, while the sample sizes vary considerably, if a trend exists here it is buried in the data. Research is examining whether a success profile can be uncovered for each group. However, Distance Education research conducted by Dave Diaz may assist the Mathematics department in constructing a profile of students whose personality type may indicate that they can function successfully in a computer-assisted instructional delivery mode. Suggest that you contact Dave Diaz.

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Enroll Status

TABLE 4		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
First Time Student	Traditional Instruction	406	55.0%	332	45.0%	738	100.0%
	Computer-Assisted	66	57.4%	49	42.6%	115	100.0%
	SUBTOTAL	472	55.3%	381	44.7%	853	100.0%
First Time Transfer Student	Traditional Instruction	102	48.8%	107	51.2%	209	100.0%
	Computer-Assisted	18	58.1%	13	41.9%	31	100.0%
	SUBTOTAL	120	50.0%	120	50.0%	240	100.0%
Returning Transfer Student	Traditional Instruction	26	52.0%	24	48.0%	50	100.0%
	Computer-Assisted	2	66.7%	1	33.3%	3	100.0%
	SUBTOTAL	28	52.8%	25	47.2%	53	100.0%
Returning Student	Traditional Instruction	88	46.1%	103	53.9%	191	100.0%
	Computer-Assisted	12	52.2%	11	47.8%	23	100.0%
	SUBTOTAL	100	46.7%	114	53.3%	214	100.0%
Continuing Students	Traditional Instruction	1059	52.5%	959	47.5%	2018	100.0%
	Computer-Assisted	93	56.7%	71	43.3%	164	100.0%
	SUBTOTAL	1152	52.8%	1030	47.2%	2182	100.0%

2) Retention by Instructional Modality by Enroll Status

TABLE 5		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
First Time Student	Traditional Instruction	195	26.4%	544	73.6%	739	100.0%
	Computer-Assisted	30	26.1%	85	73.9%	115	100.0%
	SUBTOTAL	225	26.3%	629	73.7%	854	100.0%
First Time Transfer Student	Traditional Instruction	52	24.5%	160	75.5%	212	100.0%
	Computer-Assisted	4	12.9%	27	87.1%	31	100.0%
	SUBTOTAL	56	23.0%	187	77.0%	243	100.0%
Returning Transfer Student	Traditional Instruction	13	26.0%	37	74.0%	50	100.0%
	Computer-Assisted	0	0.0%	3	100.0%	3	100.0%
	SUBTOTAL	13	24.5%	40	75.5%	53	100.0%
Returning Student	Traditional Instruction	53	27.7%	138	72.3%	191	100.0%
	Computer-Assisted	5	21.7%	18	78.3%	23	100.0%
	SUBTOTAL	58	27.1%	156	72.9%	214	100.0%
Continuing Student	Traditional Instruction	546	27.0%	1477	73.0%	2023	100.0%
	Computer-Assisted	43	26.1%	122	73.9%	165	100.0%
	SUBTOTAL	589	26.9%	1599	73.1%	2188	100.0%

COMMENTS

Neither Success nor Retention Rates differ significantly among enroll statuses between traditional and computer-assisted Math 23 courses.

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Educational Goal

TABLE 6		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Uncollected/Unreported	Traditional Instruction	0	0.0%	4	100.0%	4	100.0%
	Computer-Assisted	0	0.0%	0	0.0%	0	100.0%
	SUBTOTAL	0	0.0%	4	100.0%	4	100.0%
Educational Development	Traditional Instruction	25	40.3%	37	59.7%	62	100.0%
	Computer-Assisted	2	50.0%	2	50.0%	4	100.0%
	SUBTOTAL	27	40.9%	39	59.1%	66	100.0%
Obtain BA/BS after AA/AS	Traditional Instruction	863	54.3%	725	45.7%	1588	100.0%
	Computer-Assisted	105	58.3%	75	41.7%	180	100.0%
	SUBTOTAL	968	54.8%	800	45.2%	1768	100.0%
Obtain BA/BS without an AA/AS	Traditional Instruction	230	54.9%	189	45.1%	419	100.0%
	Computer-Assisted	21	55.3%	17	44.7%	38	100.0%
	SUBTOTAL	251	54.9%	206	45.1%	457	100.0%
Obtain an AA/AS without Transfer	Traditional Instruction	132	49.8%	133	50.2%	265	100.0%
	Computer-Assisted	18	51.4%	17	48.6%	35	100.0%
	SUBTOTAL	150	50.0%	150	50.0%	300	100.0%
Obtain a 2 yr. Vocational Degree without Transfer	Traditional Instruction	76	47.8%	83	52.2%	159	100.0%
	Computer-Assisted	5	71.4%	2	28.6%	7	100.0%
	SUBTOTAL	81	48.8%	85	51.2%	166	100.0%
Earn a Vocational Certificate	Traditional Instruction	18	54.5%	15	45.5%	33	100.0%
	Computer-Assisted	2	40.0%	3	60.0%	5	100.0%
	SUBTOTAL	20	52.6%	18	47.4%	38	100.0%
Discover/formulate career plans/goals	Traditional Instruction	57	42.2%	78	57.8%	135	100.0%
	Computer-Assisted	5	41.7%	7	58.3%	12	100.0%
	SUBTOTAL	62	42.2%	85	57.8%	147	100.0%
Prepare for a new Career	Traditional Instruction	57	46.7%	65	53.3%	122	100.0%
	Computer-Assisted	4	33.3%	8	66.7%	12	100.0%
	SUBTOTAL	61	45.5%	73	54.5%	134	100.0%
Advance in current job/career	Traditional Instruction	28	50.0%	28	50.0%	56	100.0%
	Computer-Assisted	2	66.7%	1	33.3%	3	100.0%
	SUBTOTAL	30	50.8%	29	49.2%	59	100.0%
Maintain License or Certificate	Traditional Instruction	21	42.9%	28	57.1%	49	100.0%
	Computer-Assisted	3	60.0%	2	40.0%	5	100.0%
	SUBTOTAL	24	44.4%	30	55.6%	54	100.0%
Improve Basic Skills	Traditional Instruction	12	50.0%	12	50.0%	24	100.0%
	Computer-Assisted	3	60.0%	2	40.0%	5	100.0%
	SUBTOTAL	15	51.7%	14	48.3%	29	100.0%
Complete Credits for HS Diploma or GED	Traditional Instruction	7	70.0%	3	30.0%	10	100.0%
	Computer-Assisted	0	0.0%	1	100.0%	1	100.0%
	SUBTOTAL	7	63.6%	4	36.4%	11	100.0%
Undecided on Goal	Traditional Instruction	155	55.4%	125	44.6%	280	100.0%
	Computer-Assisted	21	72.4%	8	27.6%	29	100.0%
	SUBTOTAL	176	57.0%	133	43.0%	309	100.0%

COMMENTS

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Retention by Instructional Modality by Educational Goal

TABLE 7		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Uncollected/Unreported	Traditional Instruction	6	16.7%	30	83.3%	36	100.0%
	Computer-Assisted	0	0.0%	1	100.0%	1	100.0%
	SUBTOTAL	6	16.2%	31	83.8%	37	100.0%
Educational Development	Traditional Instruction	35	20.5%	136	79.5%	171	100.0%
	Computer-Assisted	2	18.2%	9	81.8%	11	100.0%
	SUBTOTAL	37	20.3%	145	79.7%	182	100.0%
Obtain BA/BS after AA/AS	Traditional Instruction	1377	23.9%	4377	76.1%	5754	100.0%
	Computer-Assisted	106	21.6%	384	78.4%	490	100.0%
	SUBTOTAL	1483	23.8%	4761	76.2%	6244	100.0%
Obtain BA/BS without an AA/AS	Traditional Instruction	498	23.5%	1625	76.5%	2123	100.0%
	Computer-Assisted	32	21.6%	116	78.4%	148	100.0%
	SUBTOTAL	530	23.3%	1741	76.7%	2271	100.0%
Obtain an AA/AS without Transfer	Traditional Instruction	144	23.7%	464	76.3%	608	100.0%
	Computer-Assisted	12	18.2%	54	81.8%	66	100.0%
	SUBTOTAL	156	23.1%	518	76.9%	674	100.0%
Obtain a 2 yr. Vocational Degree without Transfer	Traditional Instruction	69	25.6%	201	74.4%	270	100.0%
	Computer-Assisted	7	58.3%	5	41.7%	12	100.0%
	SUBTOTAL	76	27.0%	206	73.0%	282	100.0%
Earn a Vocational Certificate	Traditional Instruction	16	25.4%	47	74.6%	63	100.0%
	Computer-Assisted	2	25.0%	6	75.0%	8	100.0%
	SUBTOTAL	18	25.4%	53	74.6%	71	100.0%
Discover/formulate career plans/goals	Traditional Instruction	75	23.3%	247	76.7%	322	100.0%
	Computer-Assisted	2	8.3%	22	91.7%	24	100.0%
	SUBTOTAL	77	22.3%	269	77.7%	346	100.0%
Prepare for a new Career	Traditional Instruction	66	27.7%	172	72.3%	238	100.0%
	Computer-Assisted	4	18.2%	18	81.8%	22	100.0%
	SUBTOTAL	70	26.9%	190	73.1%	260	100.0%
Advance in current job/career	Traditional Instruction	31	27.2%	83	72.8%	114	100.0%
	Computer-Assisted	2	28.6%	5	71.4%	7	100.0%
	SUBTOTAL	33	27.3%	88	72.7%	121	100.0%
Maintain License or Certificate	Traditional Instruction	21	23.9%	67	76.1%	88	100.0%
	Computer-Assisted	2	33.3%	4	66.7%	6	100.0%
	SUBTOTAL	23	24.5%	71	75.5%	94	100.0%
Improve Basic Skills	Traditional Instruction	16	26.7%	44	73.3%	60	100.0%
	Computer-Assisted	3	37.5%	5	62.5%	8	100.0%
	SUBTOTAL	19	27.9%	49	72.1%	68	100.0%
Complete Credits for HS Diploma or GED	Traditional Instruction	8	25.8%	23	74.2%	31	100.0%
	Computer-Assisted	0	0.0%	1	100.0%	1	100.0%
	SUBTOTAL	8	25.0%	24	75.0%	32	100.0%
Undecided on Goal	Traditional Instruction	201	26.2%	566	73.8%	767	100.0%
	Computer-Assisted	8	15.7%	43	84.3%	51	100.0%
	SUBTOTAL	209	25.6%	609	74.4%	818	100.0%

COMMENTS

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Ethnicity

TABLE 8		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
White	Traditional Instruction	3882	47.2%	4347	52.8%	8229	100.0%
	Computer-Assisted	376	55.0%	308	45.0%	684	100.0%
	SUBTOTAL	4258	47.8%	4655	52.2%	8913	100.0%
Asian/Pacific Islander	Traditional Instruction	155	46.7%	177	53.3%	332	100.0%
	Computer-Assisted	14	40.0%	21	60.0%	35	100.0%
	SUBTOTAL	169	46.0%	198	54.0%	367	100.0%
Black	Traditional Instruction	87	55.4%	70	44.6%	157	100.0%
	Computer-Assisted	8	80.0%	2	20.0%	10	100.0%
	SUBTOTAL	95	56.9%	72	43.1%	167	100.0%
Hispanic	Traditional Instruction	732	56.4%	567	43.6%	1299	100.0%
	Computer-Assisted	45	52.9%	40	47.1%	85	100.0%
	SUBTOTAL	777	56.1%	607	43.9%	1384	100.0%
Filipino	Traditional Instruction	86	53.1%	76	46.9%	162	100.0%
	Computer-Assisted	4	100.0%	0	0.0%	4	100.0%
	SUBTOTAL	90	54.2%	76	45.8%	166	100.0%
American Indian	Traditional Instruction	85	61.2%	54	38.8%	139	100.0%
	Computer-Assisted	8	57.1%	6	42.9%	14	100.0%
	SUBTOTAL	93	60.8%	60	39.2%	153	100.0%
Other/Unknown	Traditional Instruction	156	51.7%	146	48.3%	302	100.0%
	Computer-Assisted	13	59.1%	9	40.9%	22	100.0%
	SUBTOTAL	169	52.2%	155	47.8%	324	100.0%

1) Retention by Instructional Modality by Ethnicity

TABLE 9		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
White	Traditional Instruction	659	26.2%	1852	73.8%	2511	100.0%
	Computer-Assisted	66	24.8%	200	75.2%	266	100.0%
	SUBTOTAL	725	26.1%	2052	73.9%	2777	100.0%
Asian/Pacific Islander	Traditional Instruction	21	24.4%	65	75.6%	86	100.0%
	Computer-Assisted	1	8.3%	11	91.7%	12	100.0%
	SUBTOTAL	22	22.4%	76	77.6%	98	100.0%
Black	Traditional Instruction	15	24.2%	47	75.8%	62	100.0%
	Computer-Assisted	0	0.0%	6	100.0%	6	100.0%
	SUBTOTAL	15	22.1%	53	77.9%	68	100.0%
Hispanic	Traditional Instruction	116	29.4%	279	70.6%	395	100.0%
	Computer-Assisted	12	33.3%	24	66.7%	36	100.0%
	SUBTOTAL	128	29.7%	303	70.3%	431	100.0%
Filipino	Traditional Instruction	12	30.8%	27	69.2%	39	100.0%
	Computer-Assisted	2	50.0%	2	50.0%	4	100.0%
	SUBTOTAL	14	32.6%	29	67.4%	43	100.0%
American Indian	Traditional Instruction	15	31.3%	33	68.8%	48	100.0%
	Computer-Assisted	0	0.0%	5	100.0%	5	100.0%
	SUBTOTAL	15	28.3%	38	71.7%	53	100.0%
Other/Unknown	Traditional Instruction	21	28.4%	53	71.6%	74	100.0%
	Computer-Assisted	1	12.5%	7	87.5%	8	100.0%
	SUBTOTAL	22	26.8%	60	73.2%	82	100.0%

COMMENTS

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Gender

TABLE 10		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Female	Traditional Instruction	875	48.2%	941	51.8%	1816	100.0%
	Computer-Assisted	90	54.2%	76	45.8%	166	100.0%
	SUBTOTAL	965	48.7%	1017	51.3%	1982	100.0%
Male	Traditional Instruction	806	58.0%	584	42.0%	1390	100.0%
	Computer-Assisted	101	59.4%	69	40.6%	170	100.0%
	SUBTOTAL	907	58.1%	653	41.9%	1560	100.0%

1) Retention by Instructional Modality by Gender

TABLE 11		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Female	Traditional Instruction	451	24.8%	1369	75.2%	1820	100.0%
	Computer-Assisted	41	24.6%	126	75.4%	167	100.0%
	SUBTOTAL	492	24.8%	1495	75.2%	1987	100.0%
Male	Traditional Instruction	408	29.2%	987	70.8%	1395	100.0%
	Computer-Assisted	41	24.1%	129	75.9%	170	100.0%
	SUBTOTAL	449	28.7%	1116	71.3%	1565	100.0%

COMMENTS

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Primary Language

TABLE 12		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
English is NOT Student's Primary Language	Traditional Instruction	71	49.0%	74	51.0%	145	100.0%
	Computer-Assisted	5	29.4%	12	70.6%	17	100.0%
	SUBTOTAL	76	46.9%	86	53.1%	162	100.0%
English is Student's Primary Language	Traditional Instruction	1599	52.6%	1440	47.4%	3039	100.0%
	Computer-Assisted	185	58.2%	133	41.8%	318	100.0%
	SUBTOTAL	1784	53.1%	1573	46.9%	3357	100.0%
Unknown/Uncollected	Traditional Instruction	11	52.4%	10	47.6%	21	100.0%
	Computer-Assisted	1	100.0%	0	0.0%	1	100.0%
	SUBTOTAL	12	54.5%	10	45.5%	22	100.0%

1) Retention by Instructional Modality by Primary Language

TABLE 13		Withdrawal		Retained		Count	
		Count	Row %	Count	Row %		
English is NOT Student's Primary Language	Traditional Instruction	38	26.2%	107	73.8%	145	100.0%
	Computer-Assisted	1	5.9%	16	94.1%	17	100.0%
	SUBTOTAL	39	24.1%	123	75.9%	162	100.0%
English is Student's Primary Language	Traditional Instruction	818	26.8%	2230	73.2%	3048	100.0%
	Computer-Assisted	81	25.4%	238	74.6%	319	100.0%
	SUBTOTAL	899	26.7%	2468	73.3%	3367	100.0%
Unkown/Uncollected	Traditional Instruction	3	14.3%	18	85.7%	21	100.0%
	Computer-Assisted	0	0.0%	1	100.0%	1	100.0%
	SUBTOTAL	3	13.6%	19	86.4%	22	100.0%

COMMENTS

Computer-assisted instruction may be of help

Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by DSPS Status

TABLE 14		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Student is eligible-No Services Received	Traditional Instruction	27	55.1%	22	44.9%	49	100.0%
	Computer-Assisted	3	75.0%	1	25.0%	4	100.0%
	SUBTOTAL	30	56.6%	23	43.4%	53	100.0%
Student is a DSPS Participant	Traditional Instruction	147	48.8%	154	51.2%	301	100.0%
	Computer-Assisted	23	47.9%	25	52.1%	48	100.0%
	SUBTOTAL	170	48.7%	179	51.3%	349	100.0%
Unknown/Uncollected	Traditional Instruction	1507	52.8%	1349	47.2%	2856	100.0%
	Computer-Assisted	165	58.1%	119	41.9%	284	100.0%
	SUBTOTAL	1672	53.2%	1468	46.8%	3140	100.0%

2) Retention by Instructional Modality by DSPS Status

TABLE 15		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Student is eligible-No Services Received	Traditional Instruction	12	23.5%	39	76.5%	51	100.0%
	Computer-Assisted	3	75.0%	1	25.0%	4	100.0%
	SUBTOTAL	15	27.3%	40	72.7%	55	100.0%
Student is a DSPS Participant	Traditional Instruction	65	21.5%	238	78.5%	303	100.0%
	Computer-Assisted	9	18.8%	39	81.3%	48	100.0%
	SUBTOTAL	74	21.1%	277	78.9%	351	100.0%
Unknown/Uncollected	Traditional Instruction	782	27.3%	2079	72.7%	2861	100.0%
	Computer-Assisted	70	24.6%	215	75.4%	285	100.0%
	SUBTOTAL	852	27.1%	2294	72.9%	3146	100.0%

COMMENTS

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Re-entry Status

TABLE 16		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Traditional Student	Traditional Instruction	1332	57.8%	974	42.2%	2306	100.0%
	Computer-Assisted	163	62.2%	99	37.8%	262	100.0%
	SUBTOTAL	1495	58.2%	1073	41.8%	2568	100.0%
Re-entry Student	Traditional Instruction	346	38.7%	549	61.3%	895	100.0%
	Computer-Assisted	28	37.8%	46	62.2%	74	100.0%
	SUBTOTAL	374	38.6%	595	61.4%	969	100.0%

2) Retention by Instructional Modality by Re-entry Status

TABLE 17		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Traditional Student	Traditional Instruction	624	27.0%	1687	73.0%	2311	100.0%
	Computer-Assisted	64	24.3%	199	75.7%	263	100.0%
	SUBTOTAL	688	26.7%	1886	73.3%	2574	100.0%
Re-entry Student	Traditional Instruction	235	26.1%	664	73.9%	899	100.0%
	Computer-Assisted	18	24.3%	56	75.7%	74	100.0%
	SUBTOTAL	253	26.0%	720	74.0%	973	100.0%

COMMENTS

Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Age Group

TABLE 18		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
17 and under	Traditional Instruction	75	48.4%	80	51.6%	155	100.0%
	Computer-Assisted	5	35.7%	9	64.3%	14	100.0%
	SUBTOTAL	80	47.3%	89	52.7%	169	100.0%
18 - 19	Traditional Instruction	711	59.6%	482	40.4%	1193	100.0%
	Computer-Assisted	97	66.0%	50	34.0%	147	100.0%
	SUBTOTAL	808	60.3%	532	39.7%	1340	100.0%
20 - 21	Traditional Instruction	332	59.4%	227	40.6%	559	100.0%
	Computer-Assisted	40	61.5%	25	38.5%	65	100.0%
	SUBTOTAL	372	59.6%	252	40.4%	624	100.0%
22 - 25	Traditional Instruction	254	52.0%	234	48.0%	488	100.0%
	Computer-Assisted	21	50.0%	21	50.0%	42	100.0%
	SUBTOTAL	275	51.9%	255	48.1%	530	100.0%
26 - 30	Traditional Instruction	97	39.6%	148	60.4%	245	100.0%
	Computer-Assisted	12	52.2%	11	47.8%	23	100.0%
	SUBTOTAL	109	40.7%	159	59.3%	268	100.0%
31 - 40	Traditional Instruction	122	35.7%	220	64.3%	342	100.0%
	Computer-Assisted	9	29.0%	22	71.0%	31	100.0%
	SUBTOTAL	131	35.1%	242	64.9%	373	100.0%
41 - 50	Traditional Instruction	80	41.9%	111	58.1%	191	100.0%
	Computer-Assisted	7	50.0%	7	50.0%	14	100.0%
	SUBTOTAL	87	42.4%	118	57.6%	205	100.0%
51 - 65	Traditional Instruction	7	25.0%	21	75.0%	28	100.0%
	Computer-Assisted	0	0.0%	0	0.0%	0	0.0%
	SUBTOTAL	7	25.0%	21	75.0%	28	100.0%

COMMENTS

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Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

2) Retention by Instructional Modality by Age Group

TABLE 19		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
17 and under	Traditional Instruction	32	20.6%	123	79.4%	155	100.0%
	Computer-Assisted	4	28.6%	10	71.4%	14	100.0%
	SUBTOTAL	36	21.3%	133	78.7%	169	100.0%
18 - 19	Traditional Instruction	329	27.5%	867	72.5%	1196	100.0%
	Computer-Assisted	39	26.4%	109	73.6%	148	100.0%
	SUBTOTAL	368	27.4%	976	72.6%	1344	100.0%
20 - 21	Traditional Instruction	157	28.0%	404	72.0%	561	100.0%
	Computer-Assisted	14	21.5%	51	78.5%	65	100.0%
	SUBTOTAL	171	27.3%	455	72.7%	626	100.0%
22 - 25	Traditional Instruction	131	26.8%	357	73.2%	488	100.0%
	Computer-Assisted	7	16.7%	35	83.3%	42	100.0%
	SUBTOTAL	138	26.0%	392	74.0%	530	100.0%
26 - 30	Traditional Instruction	64	26.1%	181	73.9%	245	100.0%
	Computer-Assisted	7	30.4%	16	69.6%	23	100.0%
	SUBTOTAL	71	26.5%	197	73.5%	268	100.0%
31 - 40	Traditional Instruction	83	24.2%	260	75.8%	343	100.0%
	Computer-Assisted	7	22.6%	24	77.4%	31	100.0%
	SUBTOTAL	90	24.1%	284	75.9%	374	100.0%
41 - 50	Traditional Instruction	59	30.4%	135	69.6%	194	100.0%
	Computer-Assisted	4	28.6%	10	71.4%	14	100.0%
	SUBTOTAL	63	30.3%	145	69.7%	208	100.0%
51 - 65	Traditional Instruction	4	14.3%	24	85.7%	28	100.0%
	Computer-Assisted	0	0.0%	0	0.0%	0	0.0%
	SUBTOTAL	4	14.3%	24	85.7%	28	100.0%

COMMENTS

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 23 classes?**

1) Success by Instructional Modality by Planned Hours of Work

TABLE 20		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Not Planning to Work	Traditional Instruction	268	50.7%	261	49.3%	529	100.0%
	Computer-Assisted	30	45.5%	36	54.5%	66	100.0%
	SUBTOTAL	298	50.1%	297	49.9%	595	100.0%
1 - 9 hours per week	Traditional Instruction	11	42.3%	15	57.7%	26	100.0%
	Computer-Assisted	0	0.0%	3	100.0%	3	100.0%
	SUBTOTAL	11	37.9%	18	62.1%	29	100.0%
10 - 19 hours per week	Traditional Instruction	91	46.0%	107	54.0%	198	100.0%
	Computer-Assisted	11	50.0%	11	50.0%	22	100.0%
	SUBTOTAL	102	46.4%	118	53.6%	220	100.0%
20 - 29 hours per week	Traditional Instruction	362	56.0%	285	44.0%	647	100.0%
	Computer-Assisted	45	57.7%	33	42.3%	78	100.0%
	SUBTOTAL	407	56.1%	318	43.9%	725	100.0%
30 - 39 hours per week	Traditional Instruction	210	51.3%	199	48.7%	409	100.0%
	Computer-Assisted	25	69.4%	11	30.6%	36	100.0%
	SUBTOTAL	235	52.8%	210	47.2%	445	100.0%
40 or more hours per week	Traditional Instruction	179	47.1%	201	52.9%	380	100.0%
	Computer-Assisted	15	75.0%	5	25.0%	20	100.0%
	SUBTOTAL	194	48.5%	206	51.5%	400	100.0%
Unknown	Traditional Instruction	560	55.1%	457	44.9%	1017	100.0%
	Computer-Assisted	65	58.6%	46	41.4%	111	100.0%
	SUBTOTAL	625	55.4%	503	44.6%	1128	100.0%

1) Success by Instructional Modality by Planned Hours of Work

TABLE 21		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Not Planning to Work	Traditional Instruction	138	26.0%	393	74.0%	531	100.0%
	Computer-Assisted	14	21.2%	52	78.8%	66	100.0%
	SUBTOTAL	152	25.5%	445	74.5%	597	100.0%
1 - 9 hours per week	Traditional Instruction	5	19.2%	21	80.8%	26	100.0%
	Computer-Assisted	0	0.0%	3	100.0%	3	100.0%
	SUBTOTAL	5	17.2%	24	82.8%	29	100.0%
10 - 19 hours per week	Traditional Instruction	41	20.6%	158	79.4%	199	100.0%
	Computer-Assisted	1	4.5%	21	95.5%	22	100.0%
	SUBTOTAL	42	19.0%	179	81.0%	221	100.0%
20 - 29 hours per week	Traditional Instruction	181	27.9%	468	72.1%	649	100.0%
	Computer-Assisted	17	21.8%	61	78.2%	78	100.0%
	SUBTOTAL	198	27.2%	529	72.8%	727	100.0%
30 - 39 hours per week	Traditional Instruction	118	28.9%	291	71.1%	409	100.0%
	Computer-Assisted	10	27.0%	27	73.0%	37	100.0%
	SUBTOTAL	128	28.7%	318	71.3%	446	100.0%
40 or more hours per week	Traditional Instruction	112	29.4%	269	70.6%	381	100.0%
	Computer-Assisted	12	60.0%	8	40.0%	20	100.0%
	SUBTOTAL	124	30.9%	277	69.1%	401	100.0%
Unknown	Traditional Instruction	264	25.9%	756	74.1%	1020	100.0%
	Computer-Assisted	28	25.2%	83	74.8%	111	100.0%
	SUBTOTAL	292	25.8%	839	74.2%	1131	100.0%

COMMENTS

Working more than 20 hours per week may have a small adverse effect as one would expect

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Prior GPA

TABLE 22		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
0.0 - 0.9 Prior GPA	Traditional Instruction	60	77.9%	17	22.1%	77	100.0%
	Computer-Assisted	1	100.0%	0	0.0%	1	100.0%
	SUBTOTAL	61	78.2%	17	21.8%	78	100.0%
1.0 - 1.9 Prior GPA	Traditional Instruction	219	75.0%	73	25.0%	292	100.0%
	Computer-Assisted	11	73.3%	4	26.7%	15	100.0%
	SUBTOTAL	230	74.9%	77	25.1%	307	100.0%
2.0 - 2.9 Prior GPA	Traditional Instruction	480	57.9%	349	42.1%	829	100.0%
	Computer-Assisted	28	52.8%	25	47.2%	53	100.0%
	SUBTOTAL	508	57.6%	374	42.4%	882	100.0%
3.0 - 4.0 Prior GPA	Traditional Instruction	200	31.0%	446	69.0%	646	100.0%
	Computer-Assisted	13	34.2%	25	65.8%	38	100.0%
	SUBTOTAL	213	31.1%	471	68.9%	684	100.0%

1) Retention by Instructional Modality by Prior GPA

TABLE 23		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
0.0 - 0.9 Prior GPA	Traditional Instruction	36	46.8%	41	53.2%	77	100.0%
	Computer-Assisted	0	0.0%	1	100.0%	1	100.0%
	SUBTOTAL	36	46.2%	42	53.8%	78	100.0%
1.0 - 1.9 Prior GPA	Traditional Instruction	109	37.2%	184	62.8%	293	100.0%
	Computer-Assisted	4	26.7%	11	73.3%	15	100.0%
	SUBTOTAL	113	36.7%	195	63.3%	308	100.0%
2.0 - 2.9 Prior GPA	Traditional Instruction	220	26.4%	613	73.6%	833	100.0%
	Computer-Assisted	15	28.3%	38	71.7%	53	100.0%
	SUBTOTAL	235	26.5%	651	73.5%	886	100.0%
3.0 - 4.0 Prior GPA	Traditional Instruction	120	18.5%	527	81.5%	647	100.0%
	Computer-Assisted	7	18.4%	31	81.6%	38	100.0%
	SUBTOTAL	127	18.5%	558	81.5%	685	100.0%

COMMENTS

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Prior Units Completed

TABLE 24		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Fewer than 30 units completed	Traditional Instruction	1359	53.8%	1165	46.2%	2524	100.0%
	Computer-Assisted	156	58.9%	109	41.1%	265	100.0%
	SUBTOTAL	1515	54.3%	1274	45.7%	2789	100.0%
30 - 59.9 units completed	Traditional Instruction	256	48.5%	272	51.5%	528	100.0%
	Computer-Assisted	27	52.9%	24	47.1%	51	100.0%
	SUBTOTAL	283	48.9%	296	51.1%	579	100.0%
60 or more units completed	Traditional Instruction	56	42.4%	76	57.6%	132	100.0%
	Computer-Assisted	7	43.8%	9	56.3%	16	100.0%
	SUBTOTAL	63	42.6%	85	57.4%	148	100.0%

2) Retention by Instructional Modality by Prior Units Completed

TABLE 25		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Fewer than 30 units completed	Traditional Instruction	697	27.6%	1832	72.4%	2529	100.0%
	Computer-Assisted	68	25.6%	198	74.4%	266	100.0%
	SUBTOTAL	765	27.4%	2030	72.6%	2795	100.0%
30 - 59.9 units completed	Traditional Instruction	129	24.3%	401	75.7%	530	100.0%
	Computer-Assisted	9	17.6%	42	82.4%	51	100.0%
	SUBTOTAL	138	23.8%	443	76.2%	581	100.0%
60 or more units completed	Traditional Instruction	26	19.4%	108	80.6%	134	100.0%
	Computer-Assisted	5	31.3%	11	68.8%	16	100.0%
	SUBTOTAL	31	20.7%	119	79.3%	150	100.0%

COMMENTS

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Course Load

TABLE 26		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
6 or fewer units	Traditional Instruction	811	73.1%	298	26.9%	1109	100.0%
	Computer-Assisted	73	83.0%	15	17.0%	88	100.0%
	SUBTOTAL	884	73.9%	313	26.1%	1197	100.0%
6.1 - 11.9 units	Traditional Instruction	579	49.2%	598	50.8%	1177	100.0%
	Computer-Assisted	81	55.9%	64	44.1%	145	100.0%
	SUBTOTAL	660	49.9%	662	50.1%	1322	100.0%
12 - 15 units	Traditional Instruction	268	31.7%	578	68.3%	846	100.0%
	Computer-Assisted	32	35.6%	58	64.4%	90	100.0%
	SUBTOTAL	300	32.1%	636	67.9%	936	100.0%
Greater than 15 units	Traditional Instruction	23	31.1%	51	68.9%	74	100.0%
	Computer-Assisted	5	38.5%	8	61.5%	13	100.0%
	SUBTOTAL	28	32.2%	59	67.8%	87	100.0%

1) Retention by Instructional Modality by Course Load

TABLE 27		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
6 or fewer units	Traditional Instruction	595	53.6%	515	46.4%	1110	100.0%
	Computer-Assisted	58	65.2%	31	34.8%	89	100.0%
	SUBTOTAL	653	54.5%	546	45.5%	1199	100.0%
6.1 - 11.9 units	Traditional Instruction	236	19.9%	947	80.1%	1183	100.0%
	Computer-Assisted	21	14.5%	124	85.5%	145	100.0%
	SUBTOTAL	257	19.4%	1071	80.6%	1328	100.0%
12 - 15 units	Traditional Instruction	28	3.3%	820	96.7%	848	100.0%
	Computer-Assisted	3	3.3%	87	96.7%	90	100.0%
	SUBTOTAL	31	3.3%	907	96.7%	938	100.0%
Greater than 15 units	Traditional Instruction	0	0.0%	74	100.0%	74	100.0%
	Computer-Assisted	0	0.0%	13	100.0%	13	100.0%
	SUBTOTAL	0	0.0%	87	100.0%	87	100.0%

COMMENTS

Full-time Students do nearly twice as well as part-time students, who exhibit a retention rate one-third that of full-timers.

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Mathematics Research - Math 23

Research Question 1(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted Math 23 classes?**

1) Success by Instructional Modality by Part-time/Full-time Status

TABLE 28		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Part-time student	Traditional Instruction	1390	60.8%	896	39.2%	2286	100.0%
	Computer-Assisted	154	66.1%	79	33.9%	233	100.0%
	SUBTOTAL	1544	61.3%	975	38.7%	2519	100.0%
Full-time student	Traditional Instruction	291	31.6%	629	68.4%	920	100.0%
	Computer-Assisted	37	35.9%	66	64.1%	103	100.0%
	SUBTOTAL	328	32.1%	695	67.9%	1023	100.0%

2) Retention by Instructional Modality by Part-time/Full-time Status

TABLE 29		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Part-time student	Traditional Instruction	831	36.2%	1462	63.8%	2293	100.0%
	Computer-Assisted	79	33.8%	155	66.2%	234	100.0%
	SUBTOTAL	910	36.0%	1617	64.0%	2527	100.0%
Full-time student	Traditional Instruction	28	3.0%	894	97.0%	922	100.0%
	Computer-Assisted	3	2.9%	100	97.1%	103	100.0%
	SUBTOTAL	31	3.0%	994	97.0%	1025	100.0%

COMMENTS

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RESEARCH QUESTION 2:

1. **How do Success and Retention Rates in *Math 27* compare between traditionally taught and computer-assisted courses?**

   2a. What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted *Math 27* courses?

Research Question 2: **How do Success and Retention Rates in MATH 27 compare between traditionally taught and computer-assisted courses?**

Sample: The sample is comprised of Students enrolled in MATH 27 in either Fall or Spring semesters (1996-1999). Data from Summer sessions were not included.

Methodology: Student outcomes were evaluated by comparing the success and retention rates between traditional and computer-assisted modalities of instruction.

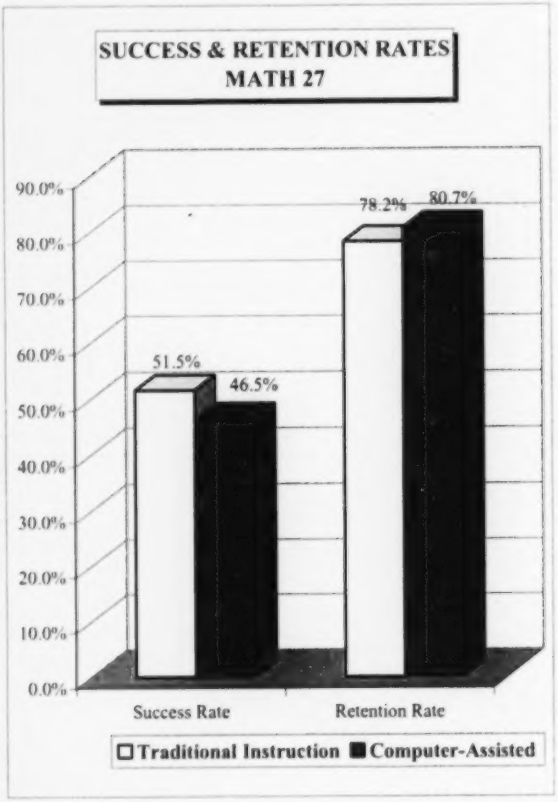
Definitions:
Successful = A, B, C, CR
Success Rate = A, B, C, CR / A, B, C, D, F, W, CR, NC
Not Successful = D, F, W, NC
Non-Success Rate = D, F, W, NC / A, B, C, D, F, W, CR, NC
Retained = A, B, C, D, F, CR, NC
Retention Rate = A, B, C, D, F, CR, NC, I, RD / A, B, C, D, F, W, CR, NC, I, RD
Significance level = if p <= .05, the test is deemed "Significant"; if p >.05, the test is deemed "Not Significant"

RESULTS

1) Success by Instructional Modality

TABLE 30	Traditional Instruction		Computer-Assisted	
	Count	%	Count	%
Not Successful	1854	48.5%	277	53.5%
Successful	1971	51.5%	241	46.5%
Total	3825	100.0%	518	100.0%

Phi,Cramer's V, Contingency Coefficient Significant (p=.033)



2) Grade Distribution by Instructional Modality

TABLE 31	Traditional Instruction		Computer-Assisted	
	Count	%	Count	%
A	353	9.2%	43	8.3%
B	595	15.5%	69	13.3%
C	856	22.3%	113	21.8%
CR	167	4.4%	16	3.1%
D	417	10.9%	90	17.4%
F	459	12.0%	65	12.5%
I	8	0.2%	0	0.0%
NC	143	3.7%	22	4.2%
RD	0	0.0%	0	0.0%
W	835	21.8%	100	19.3%
Total	3833	100.0%	518	100.0%

Pearson Chi-Square Significant (p=.003)

3) Retention by Instructional Modality

TABLE 32	Traditional Instruction		Computer-Assisted	
	Count	%	Count	%
Withdrawal	835	21.8%	100	19.3%
Retained	2998	78.2%	418	80.7%
Total	3833	100.0%	518	100.0%

Phi,Cramer's V, Contingency Coefficient Not Significant (p=.197)

COMMENTS

There is both a higher success and retention rate for math 27 than for Math 23-probably due to major and level of commitment to transfer.

Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Enroll Status

TABLE 33		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
First-Time Student	Traditional Instruction	320	53.1%	283	46.9%	603	100.0%
	Computer-Assisted	63	54.8%	52	45.2%	115	100.0%
	SUBTOTAL	383	53.3%	335	46.7%	718	100.0%
First-Time Transfer Student	Traditional Instruction	98	48.8%	103	51.2%	201	100.0%
	Computer-Assisted	20	47.6%	22	52.4%	42	100.0%
	SUBTOTAL	118	48.6%	125	51.4%	243	100.0%
Returning Transfer Student	Traditional Instruction	19	54.3%	16	45.7%	35	100.0%
	Computer-Assisted	3	50.0%	3	50.0%	6	100.0%
	SUBTOTAL	22	53.7%	19	46.3%	41	100.0%
Returning Student	Traditional Instruction	56	52.3%	51	47.7%	107	100.0%
	Computer-Assisted	12	60.0%	8	40.0%	20	100.0%
	SUBTOTAL	68	53.5%	59	46.5%	127	100.0%
Continuing Students	Traditional Instruction	1361	47.3%	1518	52.7%	2879	100.0%
	Computer-Assisted	179	53.4%	156	46.6%	335	100.0%
	SUBTOTAL	1540	47.9%	1674	52.1%	3214	100.0%

2) Retention by Instructional Modality by Enroll Status

TABLE 34		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
First-Time Student	Traditional Instruction	142	23.5%	461	76.5%	603	100.0%
	Computer-Assisted	22	19.1%	93	80.9%	115	100.0%
	SUBTOTAL	164	22.8%	554	77.2%	718	100.0%
First-Time Transfer Student	Traditional Instruction	50	24.9%	151	75.1%	201	100.0%
	Computer-Assisted	8	19.0%	34	81.0%	42	100.0%
	SUBTOTAL	58	23.9%	185	76.1%	243	100.0%
Returning Transfer Student	Traditional Instruction	8	22.9%	27	77.1%	35	100.0%
	Computer-Assisted	1	16.7%	5	83.3%	6	100.0%
	SUBTOTAL	9	22.0%	32	78.0%	41	100.0%
Returning Student	Traditional Instruction	37	34.3%	71	65.7%	108	100.0%
	Computer-Assisted	4	20.0%	16	80.0%	20	100.0%
	SUBTOTAL	41	32.0%	87	68.0%	128	100.0%
Continuing Student	Traditional Instruction	598	20.7%	2288	79.3%	2886	100.0%
	Computer-Assisted	65	19.4%	270	80.6%	335	100.0%
	SUBTOTAL	663	20.6%	2558	79.4%	3221	100.0%

COMMENTS

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Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Educational Goal

TABLE 35		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Uncollected/Unreported	Traditional Instruction	9	52.9%	8	47.1%	17	100.0%
	Computer-Assisted	1	100.0%	0	0.0%	1	100.0%
	SUBTOTAL	10	55.6%	8	44.4%	18	100.0%
Educational Development	Traditional Instruction	23	39.0%	36	61.0%	59	100.0%
	Computer-Assisted	3	42.9%	4	57.1%	7	100.0%
	SUBTOTAL	26	39.4%	40	60.6%	66	100.0%
Obtain BA/BS after AA/AS	Traditional Instruction	1057	49.0%	1101	51.0%	2158	100.0%
	Computer-Assisted	167	53.9%	143	46.1%	310	100.0%
	SUBTOTAL	1224	49.6%	1244	50.4%	2468	100.0%
Obtain BA/BS without an AA/AS	Traditional Instruction	394	51.8%	366	48.2%	760	100.0%
	Computer-Assisted	67	60.9%	43	39.1%	110	100.0%
	SUBTOTAL	461	53.0%	409	47.0%	870	100.0%
Obtain an AA/AS without Transfer	Traditional Instruction	98	46.0%	115	54.0%	213	100.0%
	Computer-Assisted	11	36.7%	19	63.3%	30	100.0%
	SUBTOTAL	109	44.9%	134	55.1%	243	100.0%
Obtain a 2 yr. Vocational Degree without Transfer	Traditional Instruction	34	44.2%	43	55.8%	77	100.0%
	Computer-Assisted	4	80.0%	1	20.0%	5	100.0%
	SUBTOTAL	38	46.3%	44	53.7%	82	100.0%
Earn a Vocational Certificate	Traditional Instruction	10	45.5%	12	54.5%	22	100.0%
	Computer-Assisted	1	33.3%	2	66.7%	3	100.0%
	SUBTOTAL	11	44.0%	14	56.0%	25	100.0%
Discover/formulate career plans/goals	Traditional Instruction	47	44.3%	59	55.7%	106	100.0%
	Computer-Assisted	5	41.7%	7	58.3%	12	100.0%
	SUBTOTAL	52	44.1%	66	55.9%	118	100.0%
Prepare for a new Career	Traditional Instruction	35	43.8%	45	56.3%	80	100.0%
	Computer-Assisted	5	50.0%	5	50.0%	10	100.0%
	SUBTOTAL	40	44.4%	50	55.6%	90	100.0%
Advance in current job/career	Traditional Instruction	9	33.3%	18	66.7%	27	100.0%
	Computer-Assisted	2	50.0%	2	50.0%	4	100.0%
	SUBTOTAL	11	35.5%	20	64.5%	31	100.0%
Maintain License or Certificate	Traditional Instruction	10	45.5%	12	54.5%	22	100.0%
	Computer-Assisted	1	100.0%	0	0.0%	1	100.0%
	SUBTOTAL	11	47.8%	12	52.2%	23	100.0%
Improve Basic Skills	Traditional Instruction	9	47.4%	10	52.6%	19	100.0%
	Computer-Assisted	2	66.7%	1	33.3%	3	100.0%
	SUBTOTAL	11	50.0%	11	50.0%	22	100.0%
Complete Credits for HS Diploma or GED	Traditional Instruction	4	40.0%	6	60.0%	10	100.0%
	Computer-Assisted	0	0.0%	0	0.0%	0	0.0%
	SUBTOTAL	4	40.0%	6	60.0%	10	100.0%
Undecided on Goal	Traditional Instruction	115	45.1%	140	54.9%	255	100.0%
	Computer-Assisted	8	36.4%	14	63.6%	22	100.0%
	SUBTOTAL	123	44.4%	154	55.6%	277	100.0%

COMMENTS

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Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Retention by Instructional Modality by Educational Goal

TABLE 36		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Uncollected/Unreported	Traditional Instruction	4	23.5%	13	76.5%	17	100.0%
	Computer-Assisted	0	0.0%	1	100.0%	1	100.0%
	SUBTOTAL	4	22.2%	14	77.8%	18	100.0%
Educational Development	Traditional Instruction	9	15.3%	50	84.7%	59	100.0%
	Computer-Assisted	1	14.3%	6	85.7%	7	100.0%
	SUBTOTAL	10	15.2%	56	84.8%	66	100.0%
Obtain BA/BS after AA/AS	Traditional Instruction	451	20.9%	1709	79.1%	2160	100.0%
	Computer-Assisted	65	21.0%	245	79.0%	310	100.0%
	SUBTOTAL	516	20.9%	1954	79.1%	2470	100.0%
Obtain BA/BS without an AA/AS	Traditional Instruction	180	23.6%	582	76.4%	762	100.0%
	Computer-Assisted	22	20.0%	88	80.0%	110	100.0%
	SUBTOTAL	202	23.2%	670	76.8%	872	100.0%
Obtain an AA/AS without Transfer	Traditional Instruction	46	21.6%	167	78.4%	213	100.0%
	Computer-Assisted	2	6.7%	28	93.3%	30	100.0%
	SUBTOTAL	48	19.8%	195	80.2%	243	100.0%
Obtain a 2 yr. Vocational Degree without Transfer	Traditional Instruction	17	21.8%	61	78.2%	78	100.0%
	Computer-Assisted	4	80.0%	1	20.0%	5	100.0%
	SUBTOTAL	21	25.3%	62	74.7%	83	100.0%
Earn a Vocational Certificate	Traditional Instruction	5	22.7%	17	77.3%	22	100.0%
	Computer-Assisted	0	0.0%	3	100.0%	3	100.0%
	SUBTOTAL	5	20.0%	20	80.0%	25	100.0%
Discover/formulate career plans/goals	Traditional Instruction	23	21.7%	83	78.3%	106	100.0%
	Computer-Assisted	1	8.3%	11	91.7%	12	100.0%
	SUBTOTAL	24	20.3%	94	79.7%	118	100.0%
Prepare for a new Career	Traditional Instruction	25	31.3%	55	68.8%	80	100.0%
	Computer-Assisted	2	20.0%	8	80.0%	10	100.0%
	SUBTOTAL	27	30.0%	63	70.0%	90	100.0%
Advance in current job/career	Traditional Instruction	5	18.5%	22	81.5%	27	100.0%
	Computer-Assisted	1	25.0%	3	75.0%	4	100.0%
	SUBTOTAL	6	19.4%	25	80.6%	31	100.0%
Maintain License or Certificate	Traditional Instruction	4	17.4%	19	82.6%	23	100.0%
	Computer-Assisted	0	0.0%	1	100.0%	1	100.0%
	SUBTOTAL	4	16.7%	20	83.3%	24	100.0%
Improve Basic Skills	Traditional Instruction	4	21.1%	15	78.9%	19	100.0%
	Computer-Assisted	1	33.3%	2	66.7%	3	100.0%
	SUBTOTAL	5	22.7%	17	77.3%	22	100.0%
Complete Credits for HS Diploma or GED	Traditional Instruction	2	20.0%	8	80.0%	10	100.0%
	Computer-Assisted	0	0.0%	0	0.0%	0	0.0%
	SUBTOTAL	2	20.0%	8	80.0%	10	100.0%
Undecided on Goal	Traditional Instruction	60	23.3%	197	76.7%	257	100.0%
	Computer-Assisted	1	4.5%	21	95.5%	22	100.0%
	SUBTOTAL	61	21.9%	218	78.1%	279	100.0%

COMMENTS

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Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Ethnicity

TABLE 37		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
White	Traditional Instruction	1393	46.4%	1607	53.6%	3000	100.0%
	Computer-Assisted	222	53.1%	196	46.9%	418	100.0%
	SUBTOTAL	1615	47.2%	1803	52.8%	3418	100.0%
Asian/Pacific Islander	Traditional Instruction	48	51.6%	45	48.4%	93	100.0%
	Computer-Assisted	11	47.8%	12	52.2%	23	100.0%
	SUBTOTAL	59	50.9%	57	49.1%	116	100.0%
Black	Traditional Instruction	28	53.8%	24	46.2%	52	100.0%
	Computer-Assisted	4	100.0%	0	0.0%	4	100.0%
	SUBTOTAL	32	57.1%	24	42.9%	56	100.0%
Hispanic	Traditional Instruction	269	57.0%	203	43.0%	472	100.0%
	Computer-Assisted	24	48.0%	26	52.0%	50	100.0%
	SUBTOTAL	293	56.1%	229	43.9%	522	100.0%
Filipino	Traditional Instruction	17	45.9%	20	54.1%	37	100.0%
	Computer-Assisted	0	0.0%	0	0.0%	0	0.0%
	SUBTOTAL	17	45.9%	20	54.1%	37	100.0%
American Indian	Traditional Instruction	36	61.0%	23	39.0%	59	100.0%
	Computer-Assisted	6	66.7%	3	33.3%	9	100.0%
	SUBTOTAL	42	61.8%	26	38.2%	68	100.0%
Other/Unknown	Traditional Instruction	63	56.3%	49	43.8%	112	100.0%
	Computer-Assisted	10	71.4%	4	28.6%	14	100.0%
	SUBTOTAL	73	57.9%	53	42.1%	126	100.0%

1) Retention by Instructional Modality by Ethnicity

TABLE 38		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
White	Traditional Instruction	637	21.2%	2370	78.8%	3007	100.0%
	Computer-Assisted	81	19.4%	337	80.6%	418	100.0%
	SUBTOTAL	718	21.0%	2707	79.0%	3425	100.0%
Asian/Pacific Islander	Traditional Instruction	16	17.2%	77	82.8%	93	100.0%
	Computer-Assisted	5	21.7%	18	78.3%	23	100.0%
	SUBTOTAL	21	18.1%	95	81.9%	116	100.0%
Black	Traditional Instruction	19	36.5%	33	63.5%	52	100.0%
	Computer-Assisted	0	0.0%	4	100.0%	4	100.0%
	SUBTOTAL	19	33.9%	37	66.1%	56	100.0%
Hispanic	Traditional Instruction	115	24.3%	358	75.7%	473	100.0%
	Computer-Assisted	9	18.0%	41	82.0%	50	100.0%
	SUBTOTAL	124	23.7%	399	76.3%	523	100.0%
Filipino	Traditional Instruction	4	10.8%	33	89.2%	37	100.0%
	Computer-Assisted	0	0.0%	0	0.0%	0	0.0%
	SUBTOTAL	4	10.8%	33	89.2%	37	100.0%
American Indian	Traditional Instruction	14	23.7%	45	76.3%	59	100.0%
	Computer-Assisted	1	11.1%	8	88.9%	9	100.0%
	SUBTOTAL	15	22.1%	53	77.9%	68	100.0%
Other/Unknown	Traditional Instruction	30	26.8%	82	73.2%	112	100.0%
	Computer-Assisted	4	28.6%	10	71.4%	14	100.0%
	SUBTOTAL	34	27.0%	92	73.0%	126	100.0%

COMMENTS

There appear to be no ethnic differences between computer-assisted and traditional instruction in both success and retention

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Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Gender

TABLE 39		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Female	Traditional Instruction	935	45.9%	1103	54.1%	2038	100.0%
	Computer-Assisted	135	51.1%	129	48.9%	264	100.0%
	SUBTOTAL	1070	46.5%	1232	53.5%	2302	100.0%
Male	Traditional Instruction	919	51.4%	868	48.6%	1787	100.0%
	Computer-Assisted	142	55.9%	112	44.1%	254	100.0%
	SUBTOTAL	1061	52.0%	980	48.0%	2041	100.0%

1) Retention by Instructional Modality by Gender

TABLE 40		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Female	Traditional Instruction	425	20.8%	1619	79.2%	2044	100.0%
	Computer-Assisted	41	15.5%	223	84.5%	264	100.0%
	SUBTOTAL	466	20.2%	1842	79.8%	2308	100.0%
Male	Traditional Instruction	410	22.9%	1379	77.1%	1789	100.0%
	Computer-Assisted	59	23.2%	195	76.8%	254	100.0%
	SUBTOTAL	469	23.0%	1574	77.0%	2043	100.0%

COMMENTS

There appear to be no significant gender differences

Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Primary Language

TABLE 41		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
English is NOT Student's Primary Language	Traditional Instruction	59	44.4%	74	55.6%	133	100.0%
	Computer-Assisted	10	43.5%	13	56.5%	23	100.0%
	SUBTOTAL	69	44.2%	87	55.8%	156	100.0%
English is Student's Primary Language	Traditional Instruction	1775	48.5%	1882	51.5%	3657	100.0%
	Computer-Assisted	264	54.0%	225	46.0%	489	100.0%
	SUBTOTAL	2039	49.2%	2107	50.8%	4146	100.0%
Unknown/Uncollected	Traditional Instruction	17	56.7%	13	43.3%	30	100.0%
	Computer-Assisted	3	50.0%	3	50.0%	6	100.0%
	SUBTOTAL	20	55.6%	16	44.4%	36	100.0%

1) Retention by Instructional Modality by Primary Language

TABLE 42		Withdrawal		Retained		Count	
		Count	Row %	Count	Row %		
English is NOT Student's Primary Language	Traditional Instruction	14	10.5%	119	89.5%	133	100.0%
	Computer-Assisted	3	13.0%	20	87.0%	23	100.0%
	SUBTOTAL	17	10.9%	139	89.1%	156	100.0%
English is Student's Primary Language	Traditional Instruction	809	22.1%	2856	77.9%	3665	100.0%
	Computer-Assisted	95	19.4%	394	80.6%	489	100.0%
	SUBTOTAL	904	21.8%	3250	78.2%	4154	100.0%
Unkown/Uncollected	Traditional Instruction	11	36.7%	19	63.3%	30	100.0%
	Computer-Assisted	2	33.3%	4	66.7%	6	100.0%
	SUBTOTAL	13	36.1%	23	63.9%	36	100.0%

COMMENTS

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Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by DSPS Status

TABLE 43		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Student is eligible-No Services Received	Traditional Instruction	26	61.9%	16	38.1%	42	100.0%
	Computer-Assisted	2	66.7%	1	33.3%	3	100.0%
	SUBTOTAL	28	62.2%	17	37.8%	45	100.0%
Student is a DSPS Participant	Traditional Instruction	142	49.5%	145	50.5%	287	100.0%
	Computer-Assisted	27	57.4%	20	42.6%	47	100.0%
	SUBTOTAL	169	50.6%	165	49.4%	334	100.0%
Unknown/Uncollected	Traditional Instruction	1686	48.2%	1810	51.8%	3496	100.0%
	Computer-Assisted	248	53.0%	220	47.0%	468	100.0%
	SUBTOTAL	1934	48.8%	2030	51.2%	3964	100.0%

2) Retention by Instructional Modality by DSPS Status

TABLE 44		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Student is eligible-No Services Received	Traditional Instruction	14	33.3%	28	66.7%	42	100.0%
	Computer-Assisted	1	33.3%	2	66.7%	3	100.0%
	SUBTOTAL	15	33.3%	30	66.7%	45	100.0%
Student is a DSPS Participant	Traditional Instruction	59	20.3%	232	79.7%	291	100.0%
	Computer-Assisted	16	34.0%	31	66.0%	47	100.0%
	SUBTOTAL	75	22.2%	263	77.8%	338	100.0%
Unknown/Uncollected	Traditional Instruction	762	21.8%	2738	78.2%	3500	100.0%
	Computer-Assisted	83	17.7%	385	82.3%	468	100.0%
	SUBTOTAL	845	21.3%	3123	78.7%	3968	100.0%

COMMENTS

DSPS students do less well (success) with the computer-assisted instrcution than non-DSPS students

Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Re-entry Status

TABLE 45		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Traditional Student	Traditional Instruction	1514	50.3%	1493	49.7%	3007	100.0%
	Computer-Assisted	243	54.9%	200	45.1%	443	100.0%
	SUBTOTAL	1757	50.9%	1693	49.1%	3450	100.0%
Re-entry Student	Traditional Instruction	339	41.5%	477	58.5%	816	100.0%
	Computer-Assisted	34	45.3%	41	54.7%	75	100.0%
	SUBTOTAL	373	41.9%	518	58.1%	891	100.0%

2) Retention by Instructional Modality by Re-entry Status

TABLE 46		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Traditional Student	Traditional Instruction	644	21.4%	2364	78.6%	3008	100.0%
	Computer-Assisted	86	19.4%	357	80.6%	443	100.0%
	SUBTOTAL	730	21.2%	2721	78.8%	3451	100.0%
Re-entry Student	Traditional Instruction	191	23.2%	632	76.8%	823	100.0%
	Computer-Assisted	14	18.7%	61	81.3%	75	100.0%
	SUBTOTAL	205	22.8%	693	77.2%	898	100.0%

COMMENTS

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Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Age Group

TABLE 47		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
17 and under	Traditional Instruction	84	46.9%	95	53.1%	179	100.0%
	Computer-Assisted	17	56.7%	13	43.3%	30	100.0%
	SUBTOTAL	101	48.3%	108	51.7%	209	100.0%
18 - 19	Traditional Instruction	723	51.4%	684	48.6%	1407	100.0%
	Computer-Assisted	123	53.0%	109	47.0%	232	100.0%
	SUBTOTAL	846	51.6%	793	48.4%	1639	100.0%
20 - 21	Traditional Instruction	458	49.6%	466	50.4%	924	100.0%
	Computer-Assisted	67	57.8%	49	42.2%	116	100.0%
	SUBTOTAL	525	50.5%	515	49.5%	1040	100.0%
22 - 25	Traditional Instruction	293	49.5%	299	50.5%	592	100.0%
	Computer-Assisted	40	53.3%	35	46.7%	75	100.0%
	SUBTOTAL	333	49.9%	334	50.1%	667	100.0%
26 - 30	Traditional Instruction	141	47.3%	157	52.7%	298	100.0%
	Computer-Assisted	14	70.0%	6	30.0%	20	100.0%
	SUBTOTAL	155	48.7%	163	51.3%	318	100.0%
31 - 40	Traditional Instruction	86	33.1%	174	66.9%	260	100.0%
	Computer-Assisted	11	37.9%	18	62.1%	29	100.0%
	SUBTOTAL	97	33.6%	192	66.4%	289	100.0%
41 - 50	Traditional Instruction	58	42.3%	79	57.7%	137	100.0%
	Computer-Assisted	3	25.0%	9	75.0%	12	100.0%
	SUBTOTAL	61	40.9%	88	59.1%	149	100.0%
51 - 65	Traditional Instruction	10	38.5%	16	61.5%	26	100.0%
	Computer-Assisted	2	50.0%	2	50.0%	4	100.0%
	SUBTOTAL	12	40.0%	18	60.0%	30	100.0%

COMMENTS

To some small extent, computer-assisted students appear to be less successful than traditionally taught students -However the small N makes this problematical.

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Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

2) Retention by Instructional Modality by Age Group

TABLE 48		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
17 and under	Traditional Instruction	39	21.8%	140	78.2%	179	100.0%
	Computer-Assisted	7	23.3%	23	76.7%	30	100.0%
	SUBTOTAL	46	22.0%	163	78.0%	209	100.0%
18 - 19	Traditional Instruction	302	21.5%	1105	78.5%	1407	100.0%
	Computer-Assisted	40	17.2%	192	82.8%	232	100.0%
	SUBTOTAL	342	20.9%	1297	79.1%	1639	100.0%
20 - 21	Traditional Instruction	202	21.8%	723	78.2%	925	100.0%
	Computer-Assisted	28	24.1%	88	75.9%	116	100.0%
	SUBTOTAL	230	22.1%	811	77.9%	1041	100.0%
22 - 25	Traditional Instruction	125	21.1%	468	78.9%	593	100.0%
	Computer-Assisted	12	16.0%	63	84.0%	75	100.0%
	SUBTOTAL	137	20.5%	531	79.5%	668	100.0%
26 - 30	Traditional Instruction	82	27.4%	217	72.6%	299	100.0%
	Computer-Assisted	6	30.0%	14	70.0%	20	100.0%
	SUBTOTAL	88	27.6%	231	72.4%	319	100.0%
31 - 40	Traditional Instruction	44	16.7%	219	83.3%	263	100.0%
	Computer-Assisted	5	17.2%	24	82.8%	29	100.0%
	SUBTOTAL	49	16.8%	243	83.2%	292	100.0%
41 - 50	Traditional Instruction	33	23.7%	106	76.3%	139	100.0%
	Computer-Assisted	1	8.3%	11	91.7%	12	100.0%
	SUBTOTAL	34	22.5%	117	77.5%	151	100.0%
51 - 65	Traditional Instruction	8	30.8%	18	69.2%	26	100.0%
	Computer-Assisted	1	25.0%	3	75.0%	4	100.0%
	SUBTOTAL	9	30.0%	21	70.0%	30	100.0%

COMMENTS

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Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Planned Hours of Work

TABLE 49		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Not Planning to Work	Traditional Instruction	295	47.4%	328	52.6%	623	100.0%
	Computer-Assisted	53	55.8%	42	44.2%	95	100.0%
	SUBTOTAL	348	48.5%	370	51.5%	718	100.0%
1 - 9 hours per week	Traditional Instruction	14	46.7%	16	53.3%	30	100.0%
	Computer-Assisted	1	33.3%	2	66.7%	3	100.0%
	SUBTOTAL	15	45.5%	18	54.5%	33	100.0%
10 - 19 hours per week	Traditional Instruction	117	42.2%	160	57.8%	277	100.0%
	Computer-Assisted	19	65.5%	10	34.5%	29	100.0%
	SUBTOTAL	136	44.4%	170	55.6%	306	100.0%
20 - 29 hours per week	Traditional Instruction	448	49.9%	450	50.1%	898	100.0%
	Computer-Assisted	72	53.7%	62	46.3%	134	100.0%
	SUBTOTAL	520	50.4%	512	49.6%	1032	100.0%
30 - 39 hours per week	Traditional Instruction	255	50.5%	250	49.5%	505	100.0%
	Computer-Assisted	38	56.7%	29	43.3%	67	100.0%
	SUBTOTAL	293	51.2%	279	48.8%	572	100.0%
40 or more hours per week	Traditional Instruction	137	42.4%	186	57.6%	323	100.0%
	Computer-Assisted	15	41.7%	21	58.3%	36	100.0%
	SUBTOTAL	152	42.3%	207	57.7%	359	100.0%
Unknown	Traditional Instruction	588	50.3%	581	49.7%	1169	100.0%
	Computer-Assisted	79	51.3%	75	48.7%	154	100.0%
	SUBTOTAL	667	50.4%	656	49.6%	1323	100.0%

1) Success by Instructional Modality by Planned Hours of Work

TABLE 50		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Not Planning to Work	Traditional Instruction	132	21.1%	494	78.9%	626	100.0%
	Computer-Assisted	21	22.1%	74	77.9%	95	100.0%
	SUBTOTAL	153	21.2%	568	78.8%	721	100.0%
1 - 9 hours per week	Traditional Instruction	7	23.3%	23	76.7%	30	100.0%
	Computer-Assisted	0	0.0%	3	100.0%	3	100.0%
	SUBTOTAL	7	21.2%	26	78.8%	33	100.0%
10 - 19 hours per week	Traditional Instruction	45	16.2%	232	83.8%	277	100.0%
	Computer-Assisted	8	27.6%	21	72.4%	29	100.0%
	SUBTOTAL	53	17.3%	253	82.7%	306	100.0%
20 - 29 hours per week	Traditional Instruction	207	23.0%	692	77.0%	899	100.0%
	Computer-Assisted	17	12.7%	117	87.3%	134	100.0%
	SUBTOTAL	224	21.7%	809	78.3%	1033	100.0%
30 - 39 hours per week	Traditional Instruction	128	25.3%	377	74.7%	505	100.0%
	Computer-Assisted	19	28.4%	48	71.6%	67	100.0%
	SUBTOTAL	147	25.7%	425	74.3%	572	100.0%
40 or more hours per week	Traditional Instruction	74	22.9%	249	77.1%	323	100.0%
	Computer-Assisted	3	8.3%	33	91.7%	36	100.0%
	SUBTOTAL	77	21.4%	282	78.6%	359	100.0%
Unknown	Traditional Instruction	242	20.6%	931	79.4%	1173	100.0%
	Computer-Assisted	32	20.8%	122	79.2%	154	100.0%
	SUBTOTAL	274	20.6%	1053	79.4%	1327	100.0%

Comments

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Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Prior GPA

TABLE 51		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
0.0 - 0.9 Prior GPA	Traditional Instruction	52	83.9%	10	16.1%	62	100.0%
	Computer-Assisted	8	100.0%	0	0.0%	8	100.0%
	SUBTOTAL	60	85.7%	10	14.3%	70	100.0%
1.0 - 1.9 Prior GPA	Traditional Instruction	192	79.7%	49	20.3%	241	100.0%
	Computer-Assisted	26	68.4%	12	31.6%	38	100.0%
	SUBTOTAL	218	78.1%	61	21.9%	279	100.0%
2.0 - 2.9 Prior GPA	Traditional Instruction	670	51.3%	635	48.7%	1305	100.0%
	Computer-Assisted	70	53.4%	61	46.6%	131	100.0%
	SUBTOTAL	740	51.5%	696	48.5%	1436	100.0%
3.0 - 4.0 Prior GPA	Traditional Instruction	265	30.4%	606	69.6%	871	100.0%
	Computer-Assisted	24	29.3%	58	70.7%	82	100.0%
	SUBTOTAL	289	30.3%	664	69.7%	953	100.0%

1) Retention by Instructional Modality by Prior GPA

TABLE 52		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
0.0 - 0.9 Prior GPA	Traditional Instruction	26	41.9%	36	58.1%	62	100.0%
	Computer-Assisted	6	75.0%	2	25.0%	8	100.0%
	SUBTOTAL	32	45.7%	38	54.3%	70	100.0%
1.0 - 1.9 Prior GPA	Traditional Instruction	89	36.9%	152	63.1%	241	100.0%
	Computer-Assisted	11	28.9%	27	71.1%	38	100.0%
	SUBTOTAL	100	35.8%	179	64.2%	279	100.0%
2.0 - 2.9 Prior GPA	Traditional Instruction	255	19.5%	1052	80.5%	1307	100.0%
	Computer-Assisted	25	19.1%	106	80.9%	131	100.0%
	SUBTOTAL	280	19.5%	1158	80.5%	1438	100.0%
3.0 - 4.0 Prior GPA	Traditional Instruction	138	15.8%	736	84.2%	874	100.0%
	Computer-Assisted	9	11.0%	73	89.0%	82	100.0%
	SUBTOTAL	147	15.4%	809	84.6%	956	100.0%

COMMENTS

As one would anticipate, as GPA increases, both success and retention increase, regardless of instructional modality.

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Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Prior Units Completed

TABLE 53		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Fewer than 30 units completed	Traditional Instruction	1230	50.5%	1208	49.5%	2438	100.0%
	Computer-Assisted	199	54.7%	165	45.3%	364	100.0%
	SUBTOTAL	1429	51.0%	1373	49.0%	2802	100.0%
30 - 59.9 units completed	Traditional Instruction	463	44.8%	570	55.2%	1033	100.0%
	Computer-Assisted	61	53.0%	54	47.0%	115	100.0%
	SUBTOTAL	524	45.6%	624	54.4%	1148	100.0%
60 or more units completed	Traditional Instruction	151	46.2%	176	53.8%	327	100.0%
	Computer-Assisted	16	45.7%	19	54.3%	35	100.0%
	SUBTOTAL	167	46.1%	195	53.9%	362	100.0%

2) Retention by Instructional Modality by Prior Units Completed

TABLE 54		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Fewer than 30 units completed	Traditional Instruction	580	23.8%	1860	76.2%	2440	100.0%
	Computer-Assisted	72	19.8%	292	80.2%	364	100.0%
	SUBTOTAL	652	23.3%	2152	76.7%	2804	100.0%
30 - 59.9 units completed	Traditional Instruction	186	18.0%	849	82.0%	1035	100.0%
	Computer-Assisted	17	14.8%	98	85.2%	115	100.0%
	SUBTOTAL	203	17.7%	947	82.3%	1150	100.0%
60 or more units completed	Traditional Instruction	61	18.4%	270	81.6%	331	100.0%
	Computer-Assisted	10	28.6%	25	71.4%	35	100.0%
	SUBTOTAL	71	19.4%	295	80.6%	366	100.0%

COMMENTS

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Mathematics Research - Math 27

Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Course Load

TABLE 55		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
6 or fewer units	Traditional Instruction	788	76.5%	242	23.5%	1030	100.0%
	Computer-Assisted	88	81.5%	20	18.5%	108	100.0%
	SUBTOTAL	876	77.0%	262	23.0%	1138	100.0%
6.1 - 11.9 units	Traditional Instruction	690	48.9%	722	51.1%	1412	100.0%
	Computer-Assisted	113	59.8%	76	40.2%	189	100.0%
	SUBTOTAL	803	50.2%	798	49.8%	1601	100.0%
12 - 15 units	Traditional Instruction	342	27.9%	883	72.1%	1225	100.0%
	Computer-Assisted	72	36.9%	123	63.1%	195	100.0%
	SUBTOTAL	414	29.2%	1006	70.8%	1420	100.0%
Greater than 15 units	Traditional Instruction	34	21.5%	124	78.5%	158	100.0%
	Computer-Assisted	4	15.4%	22	84.6%	26	100.0%
	SUBTOTAL	38	20.7%	146	79.3%	184	100.0%

1) Retention by Instructional Modality by Course Load

TABLE 56		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
6 or fewer units	Traditional Instruction	521	50.4%	512	49.6%	1033	100.0%
	Computer-Assisted	54	50.0%	54	50.0%	108	100.0%
	SUBTOTAL	575	50.4%	566	49.6%	1141	100.0%
6.1 - 11.9 units	Traditional Instruction	275	19.4%	1141	80.6%	1416	100.0%
	Computer-Assisted	43	22.8%	146	77.2%	189	100.0%
	SUBTOTAL	318	19.8%	1287	80.2%	1605	100.0%
12 - 15 units	Traditional Instruction	38	3.1%	1188	96.9%	1226	100.0%
	Computer-Assisted	3	1.5%	192	98.5%	195	100.0%
	SUBTOTAL	41	2.9%	1380	97.1%	1421	100.0%
Greater than 15 units	Traditional Instruction	1	0.6%	157	99.4%	158	100.0%
	Computer-Assisted	0	0.0%	26	100.0%	26	100.0%
	SUBTOTAL	1	0.5%	183	99.5%	184	100.0%

COMMENTS

As course load increases, both success and retention rates -probably due, again, to the level of commitment by individual students

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Research Question 2(a): **What are the profiles of successful and unsuccessful students in both traditionally taught and computer-assisted MATH 27 classes?**

1) Success by Instructional Modality by Part-time/Full-time Status

TABLE 57		Not Successful		Successful		Total	
		Count	%	Count	%	Count	%
Part-time student	Traditional Instruction	1478	60.5%	964	39.5%	2442	100.0%
	Computer-Assisted	201	67.7%	96	32.3%	297	100.0%
	SUBTOTAL	1679	61.3%	1060	38.7%	2739	100.0%
Full-time student	Traditional Instruction	376	27.2%	1007	72.8%	1383	100.0%
	Computer-Assisted	76	34.4%	145	65.6%	221	100.0%
	SUBTOTAL	452	28.2%	1152	71.8%	1604	100.0%

2) Retention by Instructional Modality by Part-time/Full-time Status

TABLE 58		Withdrawal		Retained		Total	
		Count	%	Count	%	Count	%
Part-time student	Traditional Instruction	796	32.5%	1653	67.5%	2449	100.0%
	Computer-Assisted	97	32.7%	200	67.3%	297	100.0%
	SUBTOTAL	893	32.5%	1853	67.5%	2746	100.0%
Full-time student	Traditional Instruction	39	2.8%	1345	97.2%	1384	100.0%
	Computer-Assisted	3	1.4%	218	98.6%	221	100.0%
	SUBTOTAL	42	2.6%	1563	97.4%	1605	100.0%

COMMENTS

Again, as one would anticipate, full-time students are successful nearly twice as often as part-time students and have one-third greater retention, regardless of instructional modality.

RESEARCH QUESTION 3:

3. **How do matriculation and subsequent course success rates in target courses differ between students who complete traditionally taught or computer-assisted *Math 23* or *Math 27* precursor courses?**

Research Question 3: **How do matriculation patterns and subsequent course success rates in target courses differ between students who complete traditionally taught or computer-assisted Math 23 or 27 precursor courses?**

Sample: The sample is comprised of Cohorts of students who enrolled in either Math 27 or Math 29 (traditional or computer-assisted) in Fall or Spring semesters between Spring 1996 and Fall 1998.

Methodology: Cohorts of successful students in Math 27 or Math 29 were given at least one semester to matriculate to the next logical course. The number and percentage of students who were successful in the precursor course and subsequently matriculated were provided. Additionally, the number and percentage of students who were successful in both the precursor and the target course were also provided. Data were then analyzed by class and instructional modality.

Definitions:
Successful = A, B, C, CR
Enrolled = received a grade (including W) in the target course
Percent [1] = number of students who successfully completed a precursor course **and** enrolled in a target course / number of students who were successful in the precursor course
Percent [2] = number of students who successfully completed a precursor course **and** successfully completed a target course / number of students who successfully completed a precursor course **and** enrolled in a target course

Math 23 Matriculation to and Success in Math 27

TABLE 59	Successful in Math 23	Successful in Math 23 AND Enrolled in Math 27		Successful in Math 23 AND Successful in Math 27	
	Count	Count	Percent[1]	Count	Percent[2]
Computer Assisted	100	74	74.0%	45	60.8%
Traditional	1266	948	74.9%	564	59.5%
TOTAL	1366	1022	74.8%	609	59.6%

Math 27 Matriculation to and Success in Math 29

TABLE 60	Successful in Math 27	Successful in Math 27 AND Enrolled in Math 29		Successful in Math 27 AND Successful in Math 29	
	Count	Count	Percent[1]	Count	Percent[2]
Computer Assisted	186	24	12.9%	12	50.0%
Traditional	1644	235	14.3%	131	55.7%
TOTAL	1830	259	14.2%	143	55.2%

Math 27 Matriculation to and Success in Math 42

TABLE 61	Successful in Math 27	Successful in Math 27 AND Enrolled in Math 42		Successful in Math 27 AND Successful in Math 42	
	Count	Count	Percent[1]	Count	Percent[2]
Computer Assisted	186	71	38.2%	39	54.9%
Traditional	1644	392	23.8%	225	57.4%
TOTAL	1830	463	25.3%	264	57.0%

Math 27 Matriculation to and Success in Math 27 or Math 42 (combined)

TABLE 62	Successful in Math 27	Successful in Math 27 AND Enrolled in Math 29 or 42		Successful in Math 27 AND Successful in Math 29 or 42	
	Count	Count	Percent[1]	Count	Percent[2]
Computer Assisted	186	95	51.1%	51	53.7%
Traditional	1644	627	38.1%	356	56.8%
TOTAL	1830	722	39.5%	407	56.4%

COMMENTS
No apparent differences exist between the two instructional modalities.

RESEARCH QUESTION 4:

4. **How do success and retention rates compare in *Math 29* between students who first take *Math 42* and those who do not?**

Research Question 4: **How do success and retention rates compare in Math 29 between students who first take Math 42 and those who do not?**

Sample: The sample is comprised of Students enrolled in MATH 29 between Fall 1996 and Spring 1999.

Methodology: Student outcomes were evaluated by comparing the success and retention rates in Math 29 between those students who had taken Math 42 prior to Math 29 and those students who had not.

Definitions:
Successful = A, B, C, CR
Success Rate = A, B, C, CR / A, B, C, D, F, W, CR, NC
Not Successful = D, F, W, NC
Non-Success Rate = D, F, W, NC / A, B, C, D, F, W, CR, NC
Retained = A, B, C, D, F, CR, NC
Retention Rate = A, B, C, D, F, CR, NC, I, RD / A, B, C, D, F, W, CR, NC, I, RD
Significance level = if p <= .05, the test is deemed "Significant"; if p >.05, the test is deemed "Not Significant"

RESULTS

1) Success by Instructional Modality

TABLE 63	Math 29 (42 Before)		Math 29 (42 not before)	
	Count	%	Count	%
Not Successful	26	51.0%	600	50.4%
Successful	25	49.0%	591	49.6%
Total	51	100.0%	1191	100.0%

Phi,Cramer's V, Contingency Coefficient Not Significant (p=.933)

2) Grade Distribution by Instructional Modality

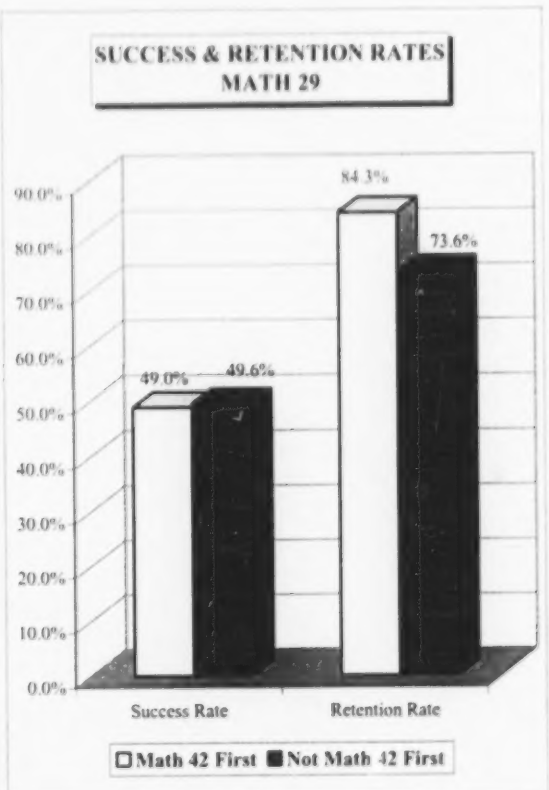
TABLE 64	Math 29 (42 Before)		Math 29 (42 not before)	
	Count	%	Count	%
A	11	21.6%	128	10.7%
B	6	11.8%	220	18.4%
C	8	15.7%	243	20.4%
CR	0	0.0%	0	0.0%
D	11	21.6%	117	9.8%
F	7	13.7%	169	14.2%
I	0	0.0%	2	0.2%
NC	0	0.0%	0	0.0%
RD	0	0.0%	0	0.0%
W	8	15.7%	314	26.3%
Total	51	100.0%	1193	100.0%

Pearson Chi-Square Significant (p=.003)

3) Retention by Instructional Modality

TABLE 65	Math 29 (42 Before)		Math 29 (42 not before)	
	Count	%	Count	%
Withdrawal	8	15.7%	314	26.4%
Retained	43	84.3%	877	73.6%
Total	51	100.0%	1191	100.0%

Phi,Cramer's V, Contingency Coefficient Significant (p=.016)



COMMENTS

Whereas success does not appear to be affected by taking Math 42 first, the retention rate in Math 29 is increased significantly.

RESEARCH QUESTION 5:

5. **How do Success and Retention Rates in *Math 65A* compare between students who arrived there via completion of *Math 29* and *42* or *Math 29* and *63*?**

Mathematics Research - Comparison of Success and Retention in Math 65A by Prerequisite Path

Research Question 5: **How do Success and Retention Rates in Math 65A compare between students who arrived there via completion of Math 29 and 42 or Math 29 and 63?**

Sample: The sample is comprised of Students enrolled in Math 65A between Fall 1996 and Spring 1999.

Methodology: Student outcomes were evaluated by comparing the success and retention rates between traditional and computer-assisted modalities of instruction.

Definitions:
Successful = A, B, C, CR
Success Rate = A, B, C, CR / A, B, C, D, F, W, CR, NC
Not Successful = D, F, W, NC
Non-Success Rate = D, F, W, NC / A, B, C, D, F, W, CR, NC
Retained = A, B, C, D, F, CR, NC
Retention Rate = A, B, C, D, F, CR, NC, I, RD / A, B, C, D, F, W, CR, NC, I, RD
Significance level = if p <= .05, the test is deemed "Significant"; if p >.05, the test is deemed "Not Significant"

RESULTS

1) Success by Instructional Modality

TABLE 66	Success in Math 65A			
	Via Math 29 and 42		Via Math 29 and 63	
	Count	%	Count	%
Not Successful	13	50.0%	98	34.9%
Successful	13	50.0%	183	65.1%
Total	26	100.0%	281	100.0%

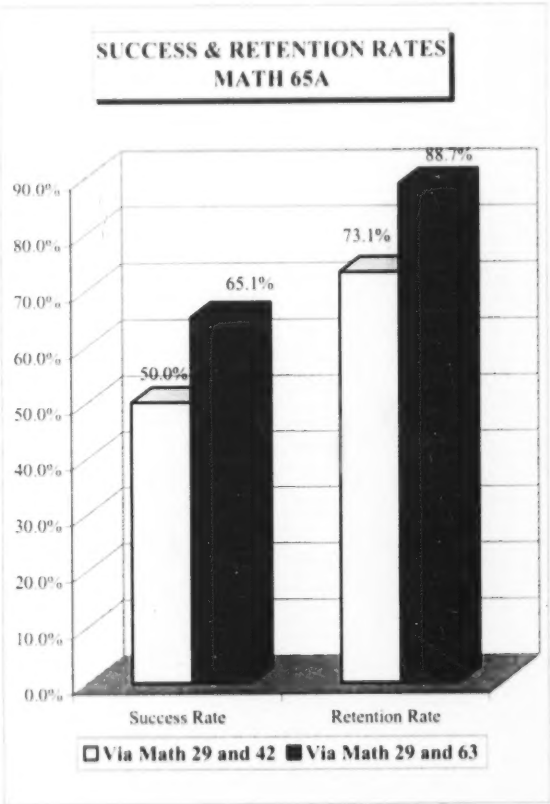
Phi,Cramer's V, Contingency Coefficient Not Significant (p=.125)

TABLE 67	Success in Math 65A			
	Via Math 29 and 42		Via Math 29 and 63	
	Count	%	Count	%
A	1	3.8%	29	10.2%
B	9	34.6%	53	18.7%
C	3	11.5%	101	35.7%
CR	0	0.0%	0	0.0%
D	3	11.5%	43	15.2%
F	3	11.5%	23	8.1%
I	0	0.0%	2	0.7%
NC	0	0.0%	0	0.0%
RD	0	0.0%	0	0.0%
W	7	26.9%	32	11.3%
Total	26	100.0%	283	100.0%

Pearson Chi-Square Significant (p=.036)

TABLE 68	Success in Math 65A			
	Via Math 29 and 42		Via Math 29 and 63	
	Count	%	Count	%
Withdrawal	7	26.9%	32	11.3%
Retained	19	73.1%	251	88.7%
Total	26	100.0%	283	100.0%

Phi,Cramer's V, Contingency Coefficient Significant (p=.022)



COMMENTS

Although the difference in success rates is not statistically significant, the difference in retention rates is. The numbers suggest that taking Math 63, rather than 42 (in conjunction with 29) better prepares students for Math 65A. A caveat is in order however. The number of cases who arrived at 65A via 42 are abhorrently small. Continued data collection will be needed to flush-out the relationship.

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